

be served in attempting the delimitation of *B. oliganthes*, the entity first described by Lessing (*Linnaea* V. 137, 1830) as *Eupatorium oliganthes*.

There are two other tomentose species of this subsection *Reticulatae*, *B. venosa* (Wooton & Standley) Robinson of northern Mexico and New Mexico, and *B. Kellermanii* Greenman of Guatemala. Both have smaller oblong to linear serrate leaves. In his introduction, Robinson referred to these two species and *B. reticulata* as being very close to *B. oliganthes* in technical characters. However, the plant collected as *B. reticulata* differs from both in its leaves and is known to vary cytologically from an accession of the latter from Arizona.

With the aid of cytological study of meiotic stages, the specimens collected matching both *B. oliganthes* and *B. verbenacea* showed regularity of division and clear metaphase plates of 9 chromosomes (figures in MS. in preparation). However, in *B. reticulata*, a regular plate at first metaphase could hardly be found due to an early dissociation of one or more pairs of bivalents. This kind of irregularity is sometimes associated with hybridization. In this may lie the explanation of the more rarely found tomentose plant with entire leaves.

Because plants in suitable stages for the study of meiosis, often do not have ripe seeds at the same time, it is not known whether this plant of *B. reticulata* would have been fertile. No achenes had matured on it. Where *B. oliganthes* occurred, there were several plants and it was possible to find two more advanced heads on another plant. Of *B. verbenacea*, Mr. Castillo of Guadalajara, who had been with me at the time of collection, obtained seeds by returning at a later time. Thus we know that both of these, as well as *B. venosa*, produced viable seeds. If the incidence of irregular meiosis favors an interpretation of hybridity, so too the size of the inflorescence of Haenke's collection, like the plant of my recent collection, might indicate hybrid vigor.—BIOLOGICAL LABORATORIES, HARVARD UNIVERSITY.

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PREPARING SPECIMENS OF PICEA AND TSUGA.—Preparation of good herbarium specimens of *Picea* and *Tsuga* requires special treatment to prevent the needles from shedding while drying in the plant press. A. J. Sharp (An improvement in the method of

preparing certain gymnosperms for the herbarium. RHODORA 37: 267–268. 1935) glued the specimen to a herbarium sheet and covered it with cheese cloth before pressing but reported lack of success with boiling. Richard Evans Schultes (The use of formaldehyde in plant collecting. RHODORA 49: 54–60. 1947) observed that some tropical plants normally difficult to prepare make better specimens after having first been treated with formaldehyde solution. Otherwise, these specimens lose their leaves or leaflets rapidly by formation of an abscission layer. F. R. Fosberg (Formaldehyde in plant collecting. Science 106: 250–251. 1947), noting that formaldehyde apparently stops formation of abscission layers, suggested this technique for the foliage of *Picea* and *Tsuga* and cones of *Abies*. However, Albert G. Johnson (Effect of formaldehyde on *Picea* and *Tsuga* herbarium specimens. Science 107: 294. 1948) reported this method unsuccessful. Edgar T. Wherry (A plastic spray for coating herbarium specimens. Bartoniana 25: 86. 1949), describing a plastic spray which forms a transparent film over herbarium sheets, remarked: “At last we have a means for keeping hemlock and spruce needles attached to the stems when pressed!”

While trying to press tree specimens in the tropics where driers could not be changed regularly, I soon learned that some shed their leaves and disintegrated in the moist press. Obviously, these twigs and their thick evergreen leaves lived long enough before drying to form abscission layers and produce poor specimens.

Prompt action to kill the tissues before abscission layers can be formed is more important than the kind of treatment. Discrepancies in effectiveness of treatments may be accounted for by variation in the time of application. A toxic solution should be successful if applied soon enough and long enough to penetrate the tissues. Spraying with the appropriate plant growth regulator might be effective also.

Perhaps the simplest way to kill plant tissues is prompt immersion in boiling water. This method is useful especially with succulents before pressing and probably could be adapted to other plants difficult to press. Boiling water is readily available in the field without cost.

For a few years I have successfully prepared herbarium speci-

mens of *Picea* and *Tsuga* by this easy method. If freshly cut branches are placed in boiling water for one minute or more before pressing, most needles will stay attached upon drying. I boil the the specimens at night after a day in the field. However, good results have been obtained after a longer interval when the specimens have remained moist. As boiling changes the color of the needles slightly, removing the glaucous appearance of the stomatal lines, it is well to press an additional small twig in an envelope or pocket unboiled to preserve normal detached leaves.—ELBERT L. LITTLE, JR., FOREST SERVICE, UNITED STATES DEPARTMENT OF AGRICULTURE, WASHINGTON 25, D. C.

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NUTTALL'S DIARY OF 1810 AND SOME INQUIRENDÆ.<sup>1</sup>—Thomas Nuttall stands as the best known naturalist of North America in the first half of the Nineteenth Century, after Audubon and Wilson in ornithology and beside Bartram, Michaux, and Pursh in botany. We now have a fairly detailed *curriculum vitae* for Nuttall, particularly from the careful investigations of the late Francis W. Pennell. Dr. Graustein's present contribution to Nuttalliana is fresh and important both for the historian seeking materials on the Old Northwest and for the biologist tracing Nuttall's routes and the sources of his later publications. This overlooked diary of 1810 is here published for the first time, with a short introductory biography, full documentation, identification of the plants and animals mentioned, and appendices of collateral Barton material bearing on this tour. Four of the twenty illustrations are first published here, including an excellent portrait of Professor Benjamin Smith Barton.

This notice of the diary may profitably take the form of an *inquirendæ* or "what we still do not know about Nuttall." This memorandum is in no sense a reflection of insufficiency on Dr. Graustein's scholarship but rather a tribute to it for her critical work makes it possible to take inventory of our knowledge of a naturalist of the first importance in American natural history. It is encouraging to know that Miss Graustein is working on a full length biography of Nuttall and these remarks may do service to the task. "He that wrestles with us strengthens our nerves and sharpens our skill." Some questions are these:

(1) What became of the plant collections numbered 1-47 mentioned in this diary? Did any survive in Barton's own collection? My studies under way at the Philadelphia Academy may throw light on this question. (2) Are these plants the ones said to have been shipped by Nuttall from New Orleans in 1811 to B. S. Barton? Nuttall took plants and seeds to England but were these merely duplicates of those sent to Barton? (3)

<sup>1</sup> *Nuttall's Travels into the Old Northwest. An Unpublished 1810 Diary.* Edited by Jeannette E. Graustein. *Chronica Botanica*, Waltham, Mass. vol. 14, pts. 1/2. pp. 88. 11 plates, 9 text figs. "1950/51" Issued Feb. 1952. \$3.00.